PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:	)	
R. Porubcan	)	
	)	Group Art Unit:
Serial No.	)	
	)	Examiner:
Filed: Herewith	)	
	)	
For: FORMULATIONS TO INCREASE *in vivo* SURVIVAL OF PROBIOTIC BACTERIA AND EXTEND THEIR SHELF-LIFE	)	

Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

Dear Sir:

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), applicants submit the documents listed on the attached PTO 1449. Copies of the listed documents, other than the listed U.S. Patents, are attached. Applicants respectfully request that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached PTO 1449 form. The Examiner is requested to consider the following comments regarding the documents.

U.S. Patent No. 6,365,148 discusses the coating of lactic acid bacteria with a water-miscible compound which may include one or more of a number of materials, including sodium alginate, but these materials are applied as a coating to the bacteria, preferably using water as a solvent. As a result of the water solvent, the water activity in the product is raised, which causes a decrease in shelf-life, because bacterial cfu are lost

during storage as a result of the water activity, as demonstrated in certain experiments set forth in the above-entitled application.

U.S. Patent No. 5,389,532 discusses a method of preparing polysaccharide gel beads containing microorganisms, where the gels can include xanthan or an alginate. Where the gel is formed from an aqueous solution and, following gel formation, the resulting beads are soaked in an aqueous solution containing sucrose (or sugars) until the solution is distributed through the beads. The beads are subsequently dried for storage and later use. The microorganisms are preferably yeast cells used to produce fermented drinks such as wine. Again, the water activity is raised by the water in the process.

U.S. Patent No. 6,033,887 discusses an improvement on the methods of U.S. 5,389,532, where the sugar solution concentration is from 100 g/kg to 300 g/kg of the gel prior to dehydration (rather than a higher concentration as in the '532 patent), so that the drying step can be shortened to avoid drying conditions which may have significant detrimental effects upon microorganism cells, and reduce viability on rehydration. Again, the water activity is raised by the water in the process.

U.S. Patent No. 6,455,052 discusses alginic acid as an enteric coating for oral preparations including probiotics. The alginic acid is dissolved in an aqueous solution containing a water soluble binding agent and the solution is sprayed on finished tablets or capsules, which are then dried. The alginic acid forms a coating, not a protective gel matrix with the probiotics, and the processing steps that include water reduce the viability and shorten the shelf-life of the probiotic bacteria.

US Patent No. 4,956,295 discusses dried viable bacteria are admixed in a particulate carrier composed primarily of an inorganic salt of low moisture absorbing

capacity together with a minor proportion of a silica gel absorbent. The inorganic salts may be sodium or calcium carbonates, bicarbonates, sulfates, or phosphates. The admixtures are storable without refrigeration.

US Patent No. 4,927,763 discusses a method is provided for forming stabilized admixtures of dried viable harmless lactic acid producing bacteria. A blend is prepared from a non-toxic particulate carrier and a hydrophilic molecular sieve adsorbent. Preferably the blend contains at least 95% by weight of a carrier which has a very low water absorbing capacity, and the molecular sieve adsorbent is blended in about 0.1 to 2 parts by weight for each 98 to 99.9 parts of the carrier. The resulting admixtures are storable without refrigeration.

In an article entitled "Survival of Ca-alginate microencapsulated *Bifidobacterium* spp. in milk and simulated gastrointestinal conditions" published in Food Microbiology, 2002, 19, 35-45, the authors examine the protective effects of microencapsulating (by a wet processing technique) several new generation strains of bifidobacteria in porous alginate microspheres exposed to pH 2.0. They report that the microencapsulation of bifidobacteria did not significantly improve survival over free cells when exposed to simulated gastric juice, but was improved over free cells when subjected to refrigerated storage in milk with 2% fat.

The process of the present invention does significantly improve the survival of bifidobacteria in simulated gastric juice, one of the same strains specified in the above study, but, in contrast to the above study, employs dry processing techniques that do not pre-encapsulate the probiotic bacteria.

In "Encapsulation of Probiotic Bacteria with Alginate-Starch and Evaluation of Survival in Simulated Gastrointestinal Conditions and in Yogurt" published in The International Journal of Food Microbiology, 2000, 62, 47-55 calcium alginate was used to microencapsulate *Lactobacillus casei* and *L. acidophilus.* The encapsulated bacteria did not demonstrate a significant increase in survival when subjected to in vitro high acid and bile salt conditions, and inclusion of alginate and glycerol in the capsule mix improved bacterial survival at –20C (survival results in yogurt were equivocal).

This submission does not represent that: (i) Applicant has fully and completely read or analyzed any of the documents cited herein, and the foregoing comments are based on a cursory review only and should be reviewed and verified by the Examiner against the documents' text; (ii) a search has been conducted; (iii) that no other documents exist which may be material to the examination of this application exist; or (iv) that any of the listed documents, or any part thereof, are material or constitute prior art under title 35 of the United States Code. Applicant reserves the right to present evidence and arguments to counter an assertion that any such documents are prior art, and/or to establish the patentability of the claimed invention.

Respectfully Submitted,

BY: _____

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) SHEET 1 OF 2	***Complete if Known***
	Application Number:
	Filing Date:
	First Named Inventor: R. Porubcan
	Group Art Unit:
	Examiner Name:
	Attorney Docket Number: PRB-1

Examiner Initials	U.S. Documents Number		U.S. Patent Document Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
	4,927,763		Sudoma et al.	**May 22, 1990**
	4,956,295		Sudoma	**September 11, 1990**
	5,389,532		Divies et al	**February 14, 1995**
	6,033,887		Charpentier	**March 7, 2000**
	6,365,148		Kim et al	**April 2, 2002**
	6,455,052		Marcussen et al	**September 24, 2002**

FOREIGN DOCUMENTS

Examiner Initials	Foreign Patent Documents Office	Number	Kind Code (if known)		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY		Translation
						0		

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) SHEET 2 OF 2	*Complete if Known*
	Application Number
	Filing Date
	First Named Inventor
	Group Art Unit
	Examiner Name
	Attorney Docket Number

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s),	T2
		Hansen, L.T., et al., Food Microbiology, 19, 35-45, 2002	
		Sultana, K., et al., Intl. J. of Food Microbiol., 62, 47-55, 2000	
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.